Introduction to Pomology

Pomology

The word Pomology comes from two wards- "pomum" and "logos". "pomum" means fruits and "logos" means knowledge.

The scientific study and cultivation of fruits is called Pomology.

On the other word, Pomology may be defined as the science of growing, storing and processing of fruits is called Pomology.

Fruit

In general, a fruit may be defined as the edible, fleshy portion of perennial, woody or herbaceous plant whose development is closely related to the flower.

In Botanical aspect, A fruit includes a matured and ripened ovary which is directly associated with the ovary.

In horticultural view, A fruit is an expanded and ripened ovary with attached and subtending reproductive structure.

e.g. Mango, Jackfruit, Banana etc.

Classification of Fruits

A. On the basis of **Growth Habit**

1) Tree. e.g. Mango, Litchi.

2) Herbaceous. e.g. Banana, Papaya.

3) Shrub. e.g. Lemon.

4) Vine. e.g. Grape, Strawberry.

B. On the basis of **Life Cycle**

1) Annual (monocarpic). e.g. Banana, Pineapple.

2) Perennial (Polycarpic). e.g. Mango.

C. On the basis of **Origin of Fruit**

1) True fruit. e.g. Mango.

2) False fruit. e.g. Apple.

3) Parthenocarpy (Development of ovary takes place without fertilization) fruit. e.g. Banana.

D. On the basis of **Pollination**

1) Self pollinated. e.g. Mango.

2) Cross pollinated. e.g. Papaya.

E. On the basis of **Climatic Requirement**

1) Tropical fruit. e.g. Mango.

2) Sub-tropical fruit. e.g. Guava.

3) Temperate fruit. e.g. Apple.

F. On the basis of **Inflorescence of Fruit**

1) Simple fruit. e.g. Mango, Litchi.

2) Aggregate fruit. e.g. Custard apple.

3) Multiple fruit. e.g. Jackfruit.

G. On the basis of **Fruit Production Season**

1) Mrigbahar: June-August. e.g. Guava.

2) Ambebahar: February-March. e.g. Mango, Litchi.

3) Year round. e.g. Papaya, Banana.

H. On the basis of **Respiratory pattern of Fruit**

1) Climatic Fruit. e.g. Mango, Banana.

2) Non-climatic fruit. e.g. Coconut.

I. On the basis of **Texture of Pericarp**

1) Dry fruit.

i. Dry dehiscence. e.g. Tamarind.

ii. Dry indehiscence. e.g. Cashew nut.

iii. Schizocarpic fruit. e.g. wild carrot.

2) Fleshy.

i. Drupe. e.g. Mango.

ii. Berry. e.g. Banana.

iii. Pepo. e.g. Water melon.

iv. Pome. e.g. Apple.

v. Hesperidium. e.g. Citrus.

J. On the basis of **Light Requirement**

1) Short day fruit.

2) Long day fruit.

K. On the basis of **Leaves Drop**

1) Evergreen. e.g. Mango, Jackfruit.

2) Deciduous. e.g. Deshy amra.

L. On the basis of **Cotyledon**

1) Monocot. e.g. Banana.

2) Dicot. e.g. Mango.

M. On the basis of **Time of growing after Planting**

1) Quick growing. e.g. Banana.

2) Medium growing. e.g. Guava, Pomegranate.

3) Delay growing. e.g. Mango, Jackfruit.

N. On the basis of **Height**

1) Tall. e.g. Mango.

2) Intermediate. e.g. Guava.

3) Dwarf. e.g. Strawberry.

O. On the basis of **Water Relation**

1) Mesophytic. e.g. Mango.

2) Zerophytic. e.g. Pineapple, Date palm.

3) Hydrophytic. e.g. Water chestnut.

Fruit Growing region of the World

1. Tropical Region

♦ More or less constant high temperature all the year.

♦ Difference between day length and night length is less.

♦ High humidity.

♦ Mild winter.

♦ Average summer temperature not less than 30^0C.

♦ Seasonal fluctuation temperature is less.

Country

Eastern part of India, Bangladesh, Burma, Thailand, Malaysia, Brazil, Peru, Philippine, Indonesia etc.

Fruit

Jackfruit, Papaya, Pineapples, Mango, Litchi, Banana etc.

Sub division of Tropical region

a) Rainy tropical region.

b) Dry tropical region.

a) Rainy tropical region

- Annual average rainfall 170-250 cm but not < 75 cm.
- Temperature is high.
- Winter absent.
- Relative humidity high.

b) Dry tropical region

- Rainfall very less.
- Scarcity of water.
- Evapotranspiration is more than rainfall.

2. Sub-tropical region

♦ Dry winter but wet summer.

♦ Winter not severe.

♦ Average winter temperature 10-20^{0}C.

♦ Average summer temperature 21-30^{0}C.

♦ Average Rainfall 125-200 cm.

♦ Difference between day length and night length is more.

♦ Sometimes frosty weather in some place.

♦ Temperature and rainfall vary with different season.

♦ Seasonal fluctuation of temperature is more.

Country

▲ Northern and Eastern part of Bangladesh.

▲ Some parts of India, Pakistan, China.

▲ South Australia.

▲ Middle area of Argentina, Lebanon, Syria.

▲ Southern part of America and Japan.

Fruit

Mango, Banana, Citrus, guava, Litchi, Tamarind, Grape etc.

3. Temperate Region

♦ Severe winter.

♦ Average summer temperature 18-21^{0}C.

♦ Average winter temperature 6-9^{0}C.

♦ Frosty weather all the year round.

♦ 50-75 days of the year remain free from frost.

Country

Argentina, Mongolia, Russia, Canada, Norway, Greenland, Northern part of UK, European country.

Fruits grown

Grape, Apple, Cherry, Gooseberry, Peach, Pear, Strawberry etc.

4. Mediterranean region

- ♦ Moderate temperature.
- ♦ Free from extreme heat or cold.
- ♦ Average summer temperature 21-27^{0}C.
- ♦ Winter temperature 4-10^{0}C.
- ♦ Annual rainfall is moderate 40-50 cm.
- ♦ Dry in summer and rainfall in winter.
- ♦ Foggy weather in summer sometimes.

Country

Middle east, Libya, Egypt, Syria, Albania, Jordan, Some parts of Spain and Saudi Arabia.

Fruits

Coffee, Date palm, Fig, orange, Grape, Olive etc.

Major fruit producing area in Bangladesh

Name of Fruits	Region
Banana	Munshiganj, Mymensingh, Norshingdi, Kushtia, Barisal, Jessore, Meherpur, Bogra.
Mango	Chapainawbgong, Natore, Rajshahi, Dinajpur, Kushtia, Chuadanga, Meherpur, Jessore.
Litchi	Dinajpur, Rajshahi, Pabna, Jessore, Kushtia, Rangpur, Dhaka, Joydebpur.
Papaya	Rajshshi, Jessore, Khulna, Chittagong, Dhaka, Pabna, Sylhet, Rangamati, Khagrachari.
Pineapple	Madhupur, Sylhet, Khagrachari, Tangail, Dhaka, Pabna.
Guava	Barisal, Jessore, Rangpur, Dhaka, Comilla, Jhalkathi.
Jackfruit	Mymensingh, Tangail, Rajshahi, Dinajpur, Jessore, Kushtia.
Coconut	Khulna, Bagerhat, Noakhali.
Ber	Comilla, Rajshahi.
Citrus fruit	Sylhet, Chittagong.
Water melon	Potenga, Rajshahi, Natore, Faridpur, Dhaka.

Scope of Fruit production in Bangladesh

Bangladesh is a well sub-tropical country. Here the fruits like mango, banana, Papaya, pineapple, litchi, guava etc grow well. Health, happy and prosperous society can be develop through cultivation of these fruits. There is a good demand of fruits in a poor and food deficit country like Bangladesh. Every person need 85g of fruit per day. But we get 38g of fruits. So production of fruit is needed to be increased. The scope of increasing fruit production is discussed below-

Climate and Soil: Bangladesh is a wet sub-tropical country, so there is a wide scope of growing tropical and sub-tropical fruits. The soil of most of the areas of Bangladesh is sandy loam which is suitable for healthy growth of fruit plants with quality fruits.

Land: At present, there is only 1.62 % land area is under fruit cultivation among the total cultivable land of the country. The land area under fruit cultivation may be increased through the motivation work, telling nutritional importance and economic benefit of growing fruits. There is the scope of growing fruits in homestead area, roads side, bank of river, canal, space adjacent to the office and institutions.

Demand and market price: There is a great demand for all classes of people for fresh fruits and also for canned fruit products because they are rich source of vitamins and minerals. Due to insufficient production, the demand and the price of fruit are very high. Due to very high demand, there is a scope of growing more fruits in the country at present.

Yield: The yield of any fruit in Bangladesh is very low compared to other developing and developed countries. Yield of pineapple 10.5 ton per hectare in our country which is very low compared with Hawaii pineapple growing (60-70 ton/ha). So there is a great scope of increasing yield of fruits in this country through adaption of improved production technology and intensive care.

Tissue culture: Farmers do not get desired number of authentic type planting materials of different fruits. There is a scope of establishing tissue culture laboratories in the nursery where disease free true type fruit seedling can be grown and supplied to the farmer.

Establishment of industries: During pick period of harvesting fruits, farmers do not get desire price due to excess supply in the market. With the installation of processing industries and cold storage, the farmers will be encouraged to cultivate more fruits.

Solution of unemployment problem: Production of fruit and establishment of industries can decrease the unemployment problem of Bangladesh.

Tree plantation: Fruit trees not only provide fruits but also they help in reducing natural calamities like flood, drought, storms etc. Every country should have 25% land under forest. But Bangladesh has only 16% under forest land. So increase forest land, fruit trees may be planted.

Importance of Fruit production in Bangladesh

The importance of growing fruits has been discussed under in brief:

1. Contribution of fruits in human nutrition: Fruits supply vitamins and minerals. It make balance diet leading to the development of sound health and happiness of human beings

- Vitamin A - Mango, Papaya, Jackfruit, bel, pineapple.
- Vitamin B - Banana, Cashew nut, Litchi etc.
- Vitamin B_2 - Bel, litchi, papaya etc.
- Vitamin C- Guava, lemon, orange, lime, pineapple etc.
- Protein- Banana, Guava, grape, Jackfruit etc.
- Phosphorus- Litchi, Banana, Pomegranate.
- Iron- Guava, sapota, unripe mango, date palm etc.
- Carbohydrates- Mango, banana, Jackfruit etc.

2. Fruit growing provides better foods as they are good source of vitamin and minerals and have medicinal properties.

3. Fruits give high energy returns per unit area compared to other crop.

4. Fruit growing is profitable.

5. Fruits are the basic need of many industries like canning, preservation, dehydration etc.

6. Fruit growing helps in the development of package, transport, refrigeration, oil and wine industries. Apiculture is depend on fruit crops.

7. Fruit production create job for rural poor.

8. Waste land can be utilized by growing hardy fruit crops like ber, bel, custard apple etc.

9. Air sound and dust pollution can easily be minimized by massive planting of fruit species because trees are known to be the best purifier.

10. Almost all fruits have medicinal value.

11. Fruits are cheap source of energy and good source of acids.

12. Earning and saving foreign currency.

13. Fuel and timber source.

Problems of Fruit growing in Bangladesh

1. Lack of improved variety.
2. Lack of quality planting material.
3. Late blooming.
4. Peoples are ignorant about the technology of fruit growing.
5. Lack of better road transport.
6. Lack of Irrigated facilities.
7. Absence of Co-operation marketing system.
8. Insect and disease.
9. Harvesting problem.
10. Storage problem.
11. Extension problem and research.
12. Low land.
13. Export problem.
14. Lack of expert.
15. Problem of bank loan.
16. Land security.
17. Poverty.
18. Economic risk due to uncontrolled market.

How to increase fruit production

1. Use of fallow land.
2. Commercial cultivation in high land.
3. Input availability.
4. Proper cultural management.
5. Suitable HYV selection.
6. Maximum use of homestead areas.
7. Develop Irrigated facilities.
8. Proper training of extension agent and farmer.
9. Develop proper marketing facilities.
10. Establishment of processing facilities.
11. Encouraging export.
12. Organised farming system.
13. Increase research and extension effort.

Factors affecting the Production of Fruits

Temperature: Suitable temperature range is required for growth and flowering of fruits more or less. If the ranges more or less changed, the fruit production is hampered. Some fruit prefer tropical region and some likes temperate. For example, Banana grows well in tropical region because it is suitable for this region. It cannot grows in temperate region. Like this Apricot grow in temperate region not in tropical region.

♣ Temperature plays important role in fruit setting. High temperature hamper fruit setting of many species.

♣ Temperature also plays role in flower initiation. For example, Cool weather is require for flower initiation of mango and litchi.

♣ Temperature also influences flower. It can also control male and female flower production. Low temperature produce male flower where as relatively high temperature produce bisexual flower.

♣ High temperature enhance the fruit development, ripening, shape, size and quality of mango.

Rainfall: Rainfall requirements varies from fruit to fruit. e.g. Banana and Papaya require mostly 10 cm rainfall but less than 5 cm rainfall damage the plant. Some plants like Rambutan, require a lot of rainfall but they can tolerate 2-3 months drought condition. For mango, 3 months dry and 7 months wet weather is required, otherwise flowering and fruit setting is hampered. Medium rainfall is require for lemon. During flowering, rainfall is harmful. Rainfall washed away the sticky substances of stigma. High rainfall and high humidity increases the disease and insect pest attack.

Light: Light influences on the development and fruit production. Light requirement are not same for all the fruits. Fruit trees require more light than shrubs and herb. On the basis of light requirement, fruit trees can be classified into two groups- long day and short day. The fruit trees temperate habitat which flower in summer are long day. The tropical fruits which flower in winter are the short day plant.

Relative humidity: Humid weather favours some fruit plants (Litchi, Guava, Coconut) and Dry weather favour some fruits (Date palm, Mango). Young leaves, flower, fruits dried up during dried weather. Humid weather increases the disease and insect pest attack. Fruit colour, size and quality deteriorate at humid weather.

Wind velocity: High velocity damage the branches of fruit trees and drops the flower.

Characteristics of soil: Banana, Papaya, Pineapple, requires high land. Citrus, pineapple, Tamarind like acidic soil. Coconut like saline soil.